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The Woolworth Building

I LIKE to see a building that shows its construction," says Mr. George Simpson, who engineered the erection of the Woolworth Tower. "There are some steel-constructed buildings that look like wall-constructed, and often they are built so intentionally, but it is stupid to make them so, because then they are neither one thing nor the other. I hate to see a building with a lot of glass doors underneath; it looks as if it were about to fall to the ground."

"The skyscraper," he continued, "is positively an outgrowth of American conditions. Congestion in certain quarters increases the value of the land, therefore we build upward instead of spreading out. This solution is exclusively American—all large European cities have the same problem but they do not work it out in the same way, nor do they bring about the same results; over there they build with an idea of permanency, using mostly brick and cement, they aspire to make a building last for centuries, but here changes come more rapidly, particularly in real estate values, and we bank our construction on the value of the land, its possible increase, and the rate on the investment, which makes it a short-lived proposition; that is why it is an almost everyday occurrence to see a twenty-story building being torn down to make place for a forty-story one."

"In the erection of high buildings, the most important question we are obliged to contend with is pressure, both weight pressure and wind pressure, and its proportional distribution down to the foundations. The skyscraper has also brought about other problems that we have solved, such as the difficulties that arise, for instance, from keeping the same temperature at the bottom of a fifty-story building as at the top; this, in turn, has introduced new methods of pipe installation and construction. The skyscraper has also brought about bigger and better things in elevators."

I asked him about the Gothic arch, whether it was impossible to reproduce it, and he answered he did not see why it should be impossible.

"It is sheer nonsense to say that the Gothic arch cannot be reproduced—as a constructive problem it is quite solvable; the reason it is not used to-day is because it is bad economy; there is not as much room under an arch as there is under a steel square. Then the arch has another disadvantage—it is necessary to pack up the base and make it heavier in order to have it take up the weight, which distributes itself in a circular course and requires a series of adjustments from top to bottom. The cross beam and uprights are the logical successors in this respect. The Gothic arch may be considered more ornamental, but I personally enjoy a square steel construction because it is good, structurally, and to my way of thinking, more beautiful."

I asked him what he thought the skyscraper was leading to, and he said, "It may lead to buildings which will be cities in themselves; a great many of them now contain everything one wants and there is really no reason for ever leaving them. Perhaps apartment houses will come to this condition, sometime."

It is only recently that architects began to realize that the skyscraper presents a new field; before, they were concerned with problems of ornamentation according to our traditional conceptions of architectural art, whereas the problem is another; it is to give expression to a radical departure in building, to be frank with, and true to a type of structure basically of our times.

How to prevent a building from soaring? What to do with the lower stories? What to do with the roof, which, although in harmony with the bottom, in tradition-ridden style, was too far up to let the harmonization be seen. What to do with the intervening space, always at odds with both roof and bottom, with too many windows, too gigantically blank a face to be ornamented. How to manage the walls, which, in spite of a desperate effort to give them solidity of aspect, never looked solid enough for their height. It was when architects began to ask themselves these questions, and to conceive of a building based, decoratively, on its internal structure, that they began to shake off the prestige of antiquity; they began to see that height, not solidity, was the character-giving asset to elaborate on, that the middle spaces could be diverted to that end, instead of to shear off the top, that windows were a boon, ornamentally, and could be used to secure lightness, airiness of aspect as at least one

step toward the characterization of a new style. It is only now that the skyscraper is beginning to appear true enough not to seem insincere.

"The skyscraper has also brought about bigger things in elevators, and the problems concerning these are quite intricate," said Mr. Simpson.

Mr. Malcolm, of the Otis Elevator Co., says: "It was in the old Equitable Building that an elevator was first used, though it was patented as far back as 1859. Real estate men laughed at the innovation; they considered it a failure and predicted it would never become practical, but it was a success from the start; the offices soon filled up and tenants were quick to realize that it had come to stay. The adoption of iron in the construction of elevators made it possible to run them more quickly, so that a building twelve to fourteen stories high became a paying proposition. Buildings, however, would probably have remained around that height, because the breadth of wall necessitated at the bottom to support greater weights would have taken up too much room; it was here that the steel 'skeleton,' together with the development of rapid-running hydraulic elevators with their economy of time in transportation, combined to make the skyscraper as we know it a paying practical building. By these means it became possible to treble and quadruple the height of buildings, thus neutralizing to a certain extent the forbidding prices in real estate."

"When we installed our elevators in the Woolworth Building we were met by a problem which, while not entirely new, we were forced to solve in a different way. It is only in this building that elevators run uninterruptedly for fifty stories and more, so that the matter of safety had to be attended to with especial care; we arranged the shafts in a manner to allow a car to drop from the top floor without danger to the passengers; ordinary doors could not withstand the pressure generated at the bottom by such a drop, so the thickness of the enclosure doors, as well as the height of the air-cushions, were increased; the increase in weight of the doors was such that it became unpractical to work them by hand and we installed an automatic system."

"The air-cushions cover a fifth of the shaft, and are so safe that

recently, when a test was made at the Empire Building, a car containing a basket of eggs was allowed to drop twenty floors and when it was checked in its downward flight by the air-cushions, it was found that not an egg had been injured."

"The elevator system in the Woolworth," he continued, "is unique, not from the number of elevators—there are only twenty-nine—but from the fact that in a building of that height the rapidity of transportation becomes of the utmost importance. It is the fastest service in the world; the cars easily attain a speed of seven hundred feet per minute, and they are all controlled from one central station; the dispatcher, by means of miniature lamps on a position indicator, can read the exact location of all the cars, whether stationary or in motion." Mr. Malcolm added that there was a private lift entirely independent of the main public one.

The emphatically vertical structure of the Woolworth Tower, reaching, as it does, into the neighborhood of the clouds, made the problem of heating a new one; it was necessary to secure an even distribution of heat over temperatures which, as Mr. Simpson says, differ greatly at the top and bottom, and this difficulty was solved by the adoption of the principle of induced circulation as applied to steam pipes.

Another unprecedented step was taken in laying the gold on the roof. The amount to be employed, being enormous, was laid in sixty to seventy foot rolls through a machine which not only took account of every angle and curve in the design, but which accomplished the work without injuring any of the frail rolls themselves. When one compares the little three or four inch leaves usually laid by hand, with the seventy foot rolls, it is evident that a curious architectural note was struck here; several months' time was saved by the mechanical process, which was just as accurate, and as faithful to the stamped copper sheeting underneath as if hand-laid.

The Woolworth Building is a symbol. Its lighting, by fogged reflectors in frosted glass, snow-white in color, diffusing a soft light comforting the eye, is of tomorrow, the decorations in the banking room are of the past; its air-washers, delivering air sucked of its moisture to the proper percent, cooling in summer, heating in winter, are of tomorrow—the mosaic decorations on the hall ceilings are of

the past; its mail-chutes and directories, beautified, bronzed, and harmonized with the building, acutely modern, are of tomorrow—the flower traceries on the outside, an admirable scale-study, academically proportioned to distance, are of the past: the Woolworth Tower looms up, at right angles to antiquity. We are apt to forget that thirty years ago such a structure was not possible; the mere, unavoidable details necessary to make it habitable, details of lighting, of heating, of transportation (the very words, "transportation," and "passengers," used of a house, point somewhere), of plumbing, of sewerage, explain how far, and with what a rush, the builders have gone; I do not say they have gone forward; I say they have struck into an epoch totally strange, away from something we have known since history began, perhaps toward the expression of this coming epoch, toward the embodiment of all these novel elements into one more unit which shall be added to our conception of architectural beauty.

J. B.



It's not the man with the hoe, it's the man with the steam shovel.



Evening of the three hundred and sixty-sixth day of the year.